

Translation

PATENT COOPERATION TREATY

PCT/FR2003/001056



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/001056	International filing date (day/month/year) 03 avril 2003 (03.04.2003)	Priority date (day/month/year) 08 avril 2002 (08.04.2002)
International Patent Classification (IPC) or national classification and IPC G02B 6/26		
Applicant OPTOGONE		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.	
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.	
<input checked="" type="checkbox"/>	This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
These annexes consist of a total of <u>5</u> sheets.	
3. This report contains indications relating to the following items:	
I <input checked="" type="checkbox"/>	Basis of the report
II <input type="checkbox"/>	Priority
III <input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV <input type="checkbox"/>	Lack of unity of invention
V <input checked="" type="checkbox"/>	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI <input type="checkbox"/>	Certain documents cited
VII <input type="checkbox"/>	Certain defects in the international application
VIII <input type="checkbox"/>	Certain observations on the international application

Date of submission of the demand 17 octobre 2003 (17.10.2003)	Date of completion of this report 21 July 2004 (21.07.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed.
- ☒ the description:  
 pages \_\_\_\_\_ 1-15 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages \_\_\_\_\_ 1-27 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
 pages \_\_\_\_\_ 1/2-2/2 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-27	YES
	Claims		NO
Inventive step (IS)	Claims	1, 2, 14-27	YES
	Claims	3-13	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims		NO

### 2. Citations and explanations

#### 1. Reference is made to the following documents:

D1: EMKEY W L ET AL: "ANALYSIS AND EVALUATION OF GRADED-INDEX FIBER-LENSES" JOURNAL OF LIGHTWAVE TECHNOLOGY, IEEE, NEW YORK, US, vol. LT-5, no. 9, 1 September 1987, pages 1156-1164;

D2: US 2001/005440 A1 (Firth et al.), 28 June 2001;

D3: US-A-5 457 759 (Kalonji et al.) 10 October 1995.

Documents D2 and D3 were not cited in the international search report.

#### 2. Prior art

Document D1 describes (the references between parentheses apply to said document) a production method for a fibre optic collimator, including the following steps of:

(a) fusing a graded-index fibre ("lens fiber") to a

single-mode fibre (figure 6a); and

(b) breaking off the graded-index fibre to the predetermined length.

3. Claims 1, 14 and 23 and the claims dependent thereon

The subject matter of claim 1 differs from D1 in that the single-mode fibre is a single-mode fibre with mode expansion, i.e. the fibre has an area in which the guided optical beam is expanded (see the description, page 3, line 7).

It follows that the subject matter of claims 1, 14 and 23 is novel (PCT Article 33(2)).

The problem that the present invention is intended to solve can therefore be considered to be that of providing an optical beam with an expanded diameter in order to facilitate fibre-end operations, such as cleaving, without adversely affecting collimation (page 4, line 29 to page 5, line 3).

The solution to this problem, as proposed in claims 1, 14 and 23 of the present application, is considered to involve an inventive step (PCT Article 33(3)) for the following reasons:

None of documents D1-D3 mentions the problem of the collimation of the optical beam from the fibre being sensitive to fibre-end operations. The use of a second segment of graded-index fibre so that the beam diameter remains expanded is not suggested in D1, D2 or D3.

The claims dependent on claims 1, 14 and 23 therefore also fulfil, as such, the PCT requirements of novelty and inventive step.

4. Claim 3 and the claims dependent thereon

The subject matter of claim 3 differs from document D1 in that there are two segments of silica fibre, one positioned between the single-mode fibre and a segment of graded-index fibre, and the other between two segments of graded-index fibre.

The problem that the present invention is intended to solve can therefore be considered to be that of optimising the distance between the single-mode fibre and the segments of graded-index fibre (the description, page 13, lines 18-24).

The solution proposed in claim 3 of the present application is not considered to be inventive for the following reasons:

Document D2 discloses the use of a lens block (figure 4, reference sign 41) to correct the longitudinal positioning of the single-mode fibre and the graded-index segment. The mere replacement of the lens block with a silica fibre is considered to be an obvious option for a person skilled in the art.

The claims which are dependent on claim 3 do not fulfil the PCT requirements of novelty and inventive step for the following reasons:

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- claims 8-13: the features are described in D3;  
and
- claims 4-7: the features are well known to a  
person skilled in the art.